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Identifying Seizures With Brain Wave Data

Background

- Data Collected with EEG
  - EEGs are often run to determine when people are having seizures.
    - Seizures are difficult to detect
    - Electrodes detect brain activity.
    - A classifier that very accurately predicts whether a seizure happened or didn't happen can assist in making the correct diagnosis.
    - For Example: Specialists use this brain activity to assist them in determining epilepsy.

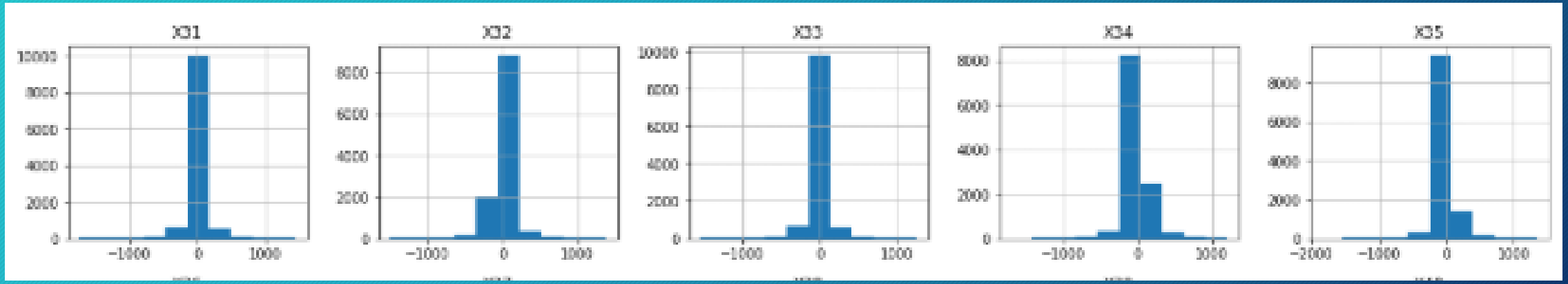
Obtain:

We used the Epileptic Seizure Recognition Data Set

It tracked the brain wave activity of 500 different individuals over the course of 23 seconds.

Exploring

- Plotting our dataset shows us that the vast majority of points for most of our data lie near the mean.
  - This lets us know to go back and standardize the data so that we have more normal distributions to work with.
- The fact that the data is anonymized made it much more difficult to get insights about specific independent variables.



Modeling

- The most successful model for our particular dataset appeared to come by using a Random Forest with Grid Search.
- While other models like Random-Forest with Grid Search, XGBoost, and SVM had greater accuracy, or precisions, or F1 scores overall, they were inferior predictors when it came to determining whether someone was having a seizure.
- The accurate detection of a seizure it paramount for this classifier and that performance is greatest when using random forest with grid search.
- Our Classifier predicts 99% of all seizures. Our accuracy doesn't change a great deal between the train and test sets.